



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/629,165	07/29/2003	Yoichi Sano	Hiroshi Tanaka C-3	5995
23474	7590	08/02/2005	EXAMINER	
FLYNN THIEL BOUTELL & TANIS, P.C. 2026 RAMBLING ROAD KALAMAZOO, MI 49008-1631			BIRENBAUM, NIRA S	
			ART UNIT	PAPER NUMBER
			1742	
DATE MAILED: 08/02/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/629,165

Applicant(s)

SANO, YOICHI

Examiner

Nira S. Birenbaum, Ph.D.

Art Unit

1742

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 03 May 2004.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-11 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 5-03-2004.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 5 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 5 recites the limitation "the water for dilution" in the second line. There is insufficient antecedent basis for this limitation in the claim.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-4 and 6-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shirota *et al.* (US Patent No.6,464,845) in view of Yamaguti *et al.* (US Patent No. 5,445,722).

Regarding claim 1, Shirota teaches a method for producing electrolyzed water using a two-chamber electrolysis cell (see figure 2A). The cell consists of an anode **2e** inside an anode chamber **2a** and a cathode **2f** inside a cathode chamber **2c**. The two

Art Unit: 1742

chambers are divided by a diaphragm **2g**. An electrolyte is added to the water to be electrolyzed (column 9, lines 65-67). Only the water provided to the cathode is previously softened. (Shirota teaches that the water used in the anode chamber is tap water, *ie.*, not softened water, and this is not recited in reference to the cathode water. See column 10, lines 1-5 and 21-25. Therefore, it can be inferred that the water supplied to the cathode chamber is deionized, *ie.*, softened, water. See also rejection for claim 2 below. In that embodiment, Shirota expressly recites that deionized water is supplied to the cathode chamber alone.)

However, Shirota does not teach that the flow rate of water supplied to the cathode chamber is 40 mL/min per ampere or less.

Yamaguti teaches a method for producing electrolyzed water wherein the degree of electrolysis can be controlled in order to obtain water with a desired pH and electrical conductivity. This control is accomplished by varying the ratio between the flow rate of water into the cell and the applied current (column 12, lines 21-30).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Shirota by optimizing the ratio of flow rate in the cathode chamber to applied current as disclosed by Yamaguti, because Yamaguti teaches that this ratio is a result-effective variable (column 12, lines 21-30). See MPEP 2144.05 IIB.

Regarding claim 2, Shirota teaches a method for producing electrolyzed water using a three-chamber electrolysis cell (see figure 1A). The cell consists of an anode **2e** inside an anode chamber **2a** and a cathode **2f** inside a cathode chamber **2c**. There

Art Unit: 1742

is an intermediate chamber **2b** between the anode and cathode chambers, and the three chambers are divided by diaphragms **2d** and **2d'**. The intermediate chamber contains an electrolyte solution which can permeate the membranes (column 7, lines 18-26 and 62-66). Only the water provided to the cathode is previously softened. The anode water is tap water (column 7, lines 4-7) and the cathode water is purified (column 7, lines 41-50). When a current is applied to the cell, acidic water is generated at the anode and basic water is generated at the cathode (column 7, line 62 to column 8, line 2).

However, Shirota does not teach that the flow rate of water supplied to the cathode chamber is 40 mL/min per ampere or less.

Yamaguti teaches a method for producing electrolyzed water wherein the degree of electrolysis can be controlled in order to obtain water with a desired pH and electrical conductivity. This control is accomplished by varying the ratio between the flow rate of water into the cell and the applied current (column 12, lines 21-30).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Shirota by optimizing the ratio of flow rate in the cathode chamber to applied current as disclosed by Yamaguti, because Yamaguti teaches that this ratio is a result-effective variable (column 12, lines 21-30). See MPEP 2144.05 IIB.

Regarding claims 3 and 6, Shirota teaches that the pure water is produced using a purifying apparatus containing an ion exchange resin (column 18, lines 19-21).

Art Unit: 1742

Regarding claims 4, 7, and 8, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the method of Shirota by optimizing the ratio of flow rate in the anode chamber to applied current as disclosed by Yamaguti, because Yamaguti teaches that this ratio is a result-effective variable (column 12, lines 21-30). See MPEP 2144.05 IIB.

Claims 5 and 9-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shirota in view of Yamaguti as applied to claims 1-4 above, and further in view of Su *et al.* (US Patent No. 5,837,124).

Shirota and Yamaguti teach the features as previously described. Furthermore, Shirota teaches that alkaline water having a pH ranging from 12 to 13 is produced in the cathode chamber, and that this pH range is desirable for its antibacterial effects (see Table 2 and column 21, lines 37-43). Although these references do not expressly teach diluting the electrolyzed water to obtain the desired pH range, it would have been obvious to one of ordinary skill in the art at the time of the invention to adjust the pH of the cathodic water by adding neutral water in order to obtain the claimed pH range, because Shirota teaches that water of this pH is preferred for its antibacterial effects (see Table 2 and column 21, lines 37-43).

However, Shirota in view of Yamaguti does not teach diluting the anode water such that the pH is between 2 and 4.

Su *et al.* teach a method for producing electrolyzed water in which the desired pH range of the anode water is from 2 to 4 (column 5, lines 6-18). It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the

Art Unit: 1742

method of Shirota in view of Yamaguti by adjusting the pH of the anodic water by adding neutral water to obtain the claimed pH range, because Su teaches that that this range is desirable for preventing formation of scale (column 3, lines 15-18).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nira S. Birenbaum, Ph.D. whose telephone number is (571) 272-8516. The examiner can normally be reached on M-F 8:00 am - 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

nsb

  
**ROY KING**  
**SUPERVISORY PATENT EXAMINER**  
**TECHNOLOGY CENTER 1700**